Digging a little deeper: what do college career advisors know about genetic counseling? What do they want to know?

Master’s Thesis

Presented to

The Faculty of the Graduate School of Arts and Sciences
Brandeis University
Graduate Program in Genetic Counseling
Judith Tsipis, PhD, Advisor

In Partial Fulfillment
of the Requirements for the Degree

Master of Science
in
Genetic Counseling

by
Sarah Carroll

May 2017
ACKNOWLEDGEMENTS

I would like to thank my committee, Judith Tsimpis, PhD, Lisa Schwartz, EdD, MS, CGC, Carolyn Rogers, MGC, LCGC, and Kate Stutz, MA, PhD for their instrumental advice and guidance through this project. Thank you to Margarita Corral for her help with my survey and data analysis. I would also like to thank Judith Tsimpis, Gretchen Schneider, Gayun Chan-Smutko, and Missy Goldberg of the Brandeis University Graduate Program in Genetic Counseling for their endless support and assistance throughout my time in the program. Lastly, I would like to thank my family, friends, and classmates for their infinite encouragement, advice, and support.
ABSTRACT

Digging a little deeper: what do college career advisors know about genetic counseling? What do they want to know?

A thesis presented to the Graduate Program in Genetic Counseling

Graduate School of Arts and Sciences
Brandeis University
Waltham, Massachusetts

By Sarah Carroll

Genetic counseling is a fast-growing profession and certified genetic counselors are in high demand. To meet this demand, student recruitment into this career must increase. College career/pre-health advisors are an underutilized resource for recruiting students to genetic counseling. Previous studies have indicated that college career advisors discuss genetic counseling significantly less frequently than other health career options, but it is not yet known what exactly college career advisors tell their students about genetic counseling and how confident they are in their own knowledge of the career. This study explored the specific knowledge that college career advisors have about the genetic counseling career as well as various details about genetic counseling training programs. We surveyed 148 college career/pre-health advisors through a national career advising organization. Advisors were asked about the requirements/qualifications of applying to genetic counseling training programs, the various features of different training programs, and the career itself. Overall, most advisors surveyed do not feel confident in their knowledge about genetic counseling. Ten percent of advisors felt extremely or very confident in discussing the genetic counseling career with students. Advisors’ own
knowledge about genetic counseling may be limited by their perceived lack of interest in the career amongst students and their encouragement of students to research the career on their own. However, more than half of the advisors surveyed responded that they want more information on all aspects of genetic counseling, including job availability and opportunities for research. This indicates that advisors are a highly motivated population in terms of learning more about the genetic counseling career path. Genetic counselors need to increase advisor knowledge about genetic counseling through the creation of easy to access resources, such as factsheets and/or presentations about genetic counseling, in order to help advisors increase recruitment into the field.

Keywords: genetic counseling, genetic counseling organizations, college career advisors, pre-health advisors, genetic counseling training programs
# TABLE OF CONTENTS

Acknowledgements........................................................................................................................................... iii

Abstract............................................................................................................................................................ iv

List of Tables.................................................................................................................................................... viii

List of Figures.................................................................................................................................................. ix

Introduction........................................................................................................................................................ 1

Purpose of This Study..................................................................................................................................... 3

Methods........................................................................................................................................................... 4

Study Design.................................................................................................................................................. 4

Participants.................................................................................................................................................... 4

Data Collection.............................................................................................................................................. 4

Data Analysis................................................................................................................................................ 5

Results.............................................................................................................................................................. 7

Demographic Characteristics of Respondents.............................................................................................. 7

Frequency of Discussion of Genetic Counseling.......................................................................................... 8

Confidence in Discussing Genetic Counseling............................................................................................. 8

Assessment of Career Advising Resources.................................................................................................. 12

Barriers to Advisors’ Knowledge about Genetic Counseling........................................................................ 14

Discussion....................................................................................................................................................... 16

Discussing Genetic Counseling with Advisees.......................................................................................... 16

Ways to Improve Advisors’ Knowledge on Genetic Counseling................................................................. 18

Development of a Factsheet on Genetic Counseling. ............................................................................... 18

Additional Presentations on Genetic Counseling to Health Advisor.........19
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisors as an Underutilized Resource</td>
<td>20</td>
</tr>
<tr>
<td>Future Directions</td>
<td>20</td>
</tr>
<tr>
<td>Study Limitations</td>
<td>21</td>
</tr>
<tr>
<td>Conclusion</td>
<td>23</td>
</tr>
<tr>
<td>References</td>
<td>24</td>
</tr>
<tr>
<td>Appendix A: Demographics Tables</td>
<td>25</td>
</tr>
<tr>
<td>Appendix B: Recruiting Materials</td>
<td>28</td>
</tr>
<tr>
<td>Appendix C: Survey Questions</td>
<td>30</td>
</tr>
<tr>
<td>Appendix D: Resource Guide on Genetic Counseling</td>
<td>38</td>
</tr>
<tr>
<td>Appendix E: Answers to True/False Survey Questions</td>
<td>41</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table A: Demographics: State of Employment.................................................................25
Table B: Demographics: Institution and Advising Experience.........................................26
Table C: Demographics: Home Departments and Nearest Genetic Counseling Training Program......................................................................................................................27
LIST OF FIGURES

Figure 1: Frequency of Discussing Genetic Counseling as a Career Option in the Past Three Years........................................................................................................................................8

Figure 2: Level of Confidence in Discussing Various Aspects of Genetic Counseling with Students........................................................................................................................................9

Figure 3: Resources Advisors Used to Gather Information on Genetic Counseling............12

Figure 4: Resources Advisors Provided to Students about Genetic Counseling.................13

Figure 5: Topics about Genetic Counseling that Advisors Want More Information On...14
INTRODUCTION

Genetic counseling is a relatively new field that was formally established in 1940 with the first Master’s program specifically designed to train genetic counselors beginning in 1969 at Sarah Lawrence College (Smith, 1993; WHO, 2016). Genetic counseling is the process of providing genetic information about a disease or condition to patients who: may have the condition, may be at an increased risk of getting the condition, or may be at an increased risk of passing it on to their children (WHO, 2016). Today, it is a specialized field that requires graduation from an accredited training program. Since its foundation, the profession of genetic counseling has grown at a rapid pace. There are now 37 accredited genetic counseling training programs in North America and the number of genetic counselors has increased by 88% since 2006 (Accreditation Council for Genetic Counseling, 2017; NSGC Professional Status Survey, 2016). Genetic counseling has a projected increase in employment of 29% over the years 2014-2024 (NSGC Professional Status Survey, 2016). As the demand for genetic counselors increases, recruitment into the field needs to expand so as to meet this growing need.

Awareness of Genetic Counseling

Many studies have aimed to assess the overall awareness of genetic counseling as a career option in academic or educational settings. Previous research has shown that, amongst high school and university students, 40.8% of respondents had never heard of
genetic counseling (Oh, 2002). Another study that surveyed high school guidance counselors showed that only 17% of respondents discussed genetic counseling as a career option with their students (Kumaravel et al 2011). A survey of genetic counseling graduate students in 2005 reported that the sources that provided them with the most abundant information about the field were their high school or college classes, not their college career advisors (Lega et al. 2005). Many practicing genetic counselors described accidentally stumbling upon genetic counseling as a career choice, rather than discovering genetic counseling through a career advisor (Lewis, 2010). These studies not only indicate that genetic counseling is an unfamiliar career choice to many, but also underscore the fact that college career advisors have been an underutilized resource for recruiting students into the genetic counseling field.

Recent research by Rogers et al (2016) assessed the familiarity that college career advisors have with genetic counseling as a career option. After surveying 349 college career advisors, they found that genetic counseling was the least commonly discussed career option out of a selection of ten health careers. They also found that 10.3% of respondents had never heard of genetic counseling before taking the survey. Only 47% of respondents reported discussing genetic counseling with at least one student in the past year and, of those, the average number of students they advised on genetic counseling over the past year was 2.9. They also asked respondents what resources they would like in order to improve their own knowledge base about genetic counseling, and 70.2% of respondents indicated genetic counseling professional websites (Rogers et al, 2016).

Rogers et al (2016) concluded that college career advisors would benefit from having more information about genetic counseling so that they can more confidently
advise more students on this career path in the future. They also suggested that a follow-up study could survey those career counselors who had discussed genetic counseling with at least one student to determine their interest in receiving more detailed information about the field (Rogers et al, 2016). Our study aimed to address both of these current gaps in knowledge.

Purpose of this Study

This study served as a follow-up to Rogers et al (2016) and was designed to learn what college career/pre-health advisors are telling their students about genetic counseling as a career option, how accurate that information is, and if there are any significant misperceptions about the field of genetic counseling that need correcting. The results of this study will help advisors to access more accurate and updated information on genetic counseling in the hopes that they will pass this information on to interested students. The long-term aim of this study is to raise awareness of genetic counseling as a career option and, ultimately, increase the overall number of qualified applicants to genetic counseling training programs.
METHODS

Study Design:

This was a cross-sectional quantitative survey study supported by qualitative input by study participants. The Brandeis University Institutional Review Board deemed that this study was exempt from full review.

Participants:

Research participant criteria included being a currently practicing college career advisor or pre-health professional advisor in the United States who belongs to the National Association of Advisors for the Health Professions (NAAHP). Those advisors who are not currently practicing career advisors in the United States and/or who have not advised on genetic counseling at least once in the past three years were excluded from the survey.

Data Collection:

We used an anonymous online survey created through Qualtrics for data collection. We emailed NAAHP to recruit participants through their member listserv (Appendix B). Approximately two weeks after the initial recruitment emails were sent, we sent email reminders through the same listserv. The survey was open from January 30th, 2017 to February 17th, 2017 and contained a series of 33 questions that were multiple choice, Likert scale, true/false, and “Check all that apply” questions (Appendix
C). Only the respondents who met the inclusion criteria entered the full survey. The survey was divided into four sections, which were:

1. Experience with Advising Students on Genetic Counseling
2. Resources on Genetic Counseling
3. Assessing what Advisors want to know about Genetic Counseling
4. Advisor Demographics.

The survey also included open-ended questions regarding the experiences college career advisors have had when advising students on the different steps in the process to becoming a genetic counselor.

Upon completion of the survey, participants were given access to a Resource Guide on Genetic Counseling, which we created and developed as part of this study (Appendix D), as well as the answers to the true/false survey questions about different aspects of genetic counseling (Appendix E). Participants also had the option to enter a raffle to win one of six $25 Amazon gift cards. Answers to survey questions were not linked to the email addresses entered for the raffle.

Data Analysis:

We analyzed the quantitative data using SPSS software version 22 and Microsoft Excel, for frequencies of responses as well as for associations and correlations using bivariate correlation analysis and Chi-squared analysis. We determined statistical significance based on a level of 0.05 for all associations. To determine response rate, we asked NAAHP how many members belong to their organization.

To identify themes from open-ended questions, we used inductive coding. First, we manually read every response and identified keywords and phrases. Then, we coded
each response based on the key word or phrase and counted how often that code was used. If more than five participants’ responses fell into the same code, we identified that code as a theme.
RESULTS

Demographic Characteristics of Respondents

All members of NAAHP (approximately 1,840) received an invitation to participate in the survey. A total of 186 people responded to the survey, corresponding to an approximately 10% response rate. We discarded 38 responses because they were either incomplete or they did not meet inclusion criteria, resulting in 148 responses being used for data analysis.

The demographic characteristics of the respondents are summarized in Tables A-C (Appendix A). Respondents represent 35 states with most (58.1%) working at smaller institutions with less than 5,000 students. Approximately 71.3% of respondents work at institutions that have fewer than five college career advisors in total. The respondents’ years of experience ranged from 1 to 42 years of advising experience, with the average being 10. The majority of the respondents (64.2%) advise more than 150 students per academic year. Approximately 90% of respondents spend the majority of their time advising pre-health professional students. Thirty-six percent of respondents also serve on the faculty at their institution and, of those, 54.7% hold appointments in the biology department. The majority (84.4%) of respondents work at an institution without a genetic counseling graduate training program and approximately 68% of respondents do not have a genetic counseling training program in their city.
Frequency of Discussion of Genetic Counseling

We asked respondents how frequently they discussed genetic counseling as a career option with their students over the past three years. The majority of advisors (62.2%) responded that they discussed genetic counseling 1-4 times over the past three years, with respondents discussing genetic counseling an average of 2.5 times (Figure 1).

**FIGURE 1: Frequency of discussing genetic counseling as a career option in the past three years (N=148).**

Approximately 22% of the respondents have discussed genetic counseling 5-10 times over the past three years while 15.5% discussed genetic counseling more than 10 times over the past three years (Figure 1). When asked how often the student initiated the conversation with the advisor about genetic counseling as a career option, approximately 30% of respondents reported that students only rarely initiated the conversation, while another 35% reported that the students were generally the ones to bring up the topic.

Confidence in Discussing Genetic Counseling

In order to assess how confident advisors felt when discussing genetic counseling with students, we asked them to self-report their confidence level for: 1) the
requirements/qualifications for applying to genetic counseling training programs, 2) the
different aspects of various training programs, and 3) the profession itself.

A majority of respondents were either moderately confident (30.8%) or slightly
confident (24%) when discussing the requirements for admission, while 28.1% were not
at all confident (N=146) (Figure 2). Approximately 17.1% of respondents indicated that
they felt extremely or very confident in discussing the requirements/qualifications for
applying to genetic counseling training programs.

**FIGURE 2: Level of confidence in discussing various aspects of genetic counseling
with students.**

We then asked respondents whether a series of specific statements regarding the
requirements/qualification for applying to genetic counseling training programs were
“mostly true”, “mostly false”, or “unsure”. Regardless of their self-reported confidence
level, the majority of the respondents answered most questions correctly. However,
31.0% of respondents were unsure about whether some experience in crisis counseling was highly recommended prior to applying to a genetic counseling program and 23.2% of respondents were unsure if programs required students to submit GRE scores as part of their application.

We found that a majority of respondents (52.8%) were not at all confident in discussing the various features of different genetic counseling training programs with students (N=142) (Figure 2). Twenty-six percent were slightly confident, 14.8% were moderately confident, and 4.9% were very confident. Only 1.4% of respondents indicated that they were extremely confident.

The decrease in self-confidence was reflected in the uncertainty demonstrated in responses to the true/false section about the various features of different genetic counseling training programs. For example, 65.2% of respondents were unsure if there are more than 60 training programs currently in the US. Approximately 53% percent of respondents were unsure if coursework amongst all the programs is standardized or not. In addition, 68.1% of respondents were unsure if all programs require completion of a lab course as part of the curriculum and 65.7% of respondents were unsure if all students must do a thesis project (or equivalent) in order to graduate. Finally, 53.6% of respondents were unsure about the balance of coursework in counseling/psychology as compared to genetics.

When discussing the genetic counseling career with students, the majority of respondents were moderately confident (31.4%), slightly confident (34.3%), or not at all confident (24.3%) (N=140) (Figure 2). Only 10% of respondents indicated that they felt extremely or very confident in discussing genetic counseling as a career with students.
Again, this lack of self-confidence was reflected in the number of uncertain responses in the true/false section. Approximately 43.9% of respondents were unsure whether the average salary for a newly minted genetic counselor is between $60,000-$80,000. In addition, 53.2% of respondents were unsure whether an increasing number of genetic counselors are now working in research positions and 40.4% were also unsure whether the main areas of work for a genetic counselor are cancer, pediatrics, and prenatal. The plurality of respondents (43.5%) was unsure whether all genetic counselors work directly with patients.

We next compared the respondents’ confidence levels with other aspects of the advisors’ experiences advising students on genetic counseling. We found a significant correlation between advising more students on genetic counseling and advisors’ feeling more confident in their discussion of the three separate areas of genetic counseling: the requirements/qualifications of training programs, features of genetic counseling training programs, and the career itself, p<0.05.

We also found a significant relationship between the level of confidence respondents had about discussing genetic counseling and their own personal interaction with a genetic counselor, genetic counseling student, or genetic counseling training program, p<0.05. In addition, we found a significant relationship between level of confidence and providing students with the National Society of Genetic Counselors (NSGC) website, the Accreditation Council for Genetic Counseling (ACGC) website, and specific genetic counseling training websites, p<0.05.

Independently, we found a significant positive relationship between confidence in discussing the three areas of genetic counseling (requirements/qualifications of training
programs, differences in training programs, and the career itself) and years of experience as an advisor, p<0.05. However, we found no significant correlation between confidence in discussing the different genetic counseling training programs and the genetic counseling career with students and advisors having a genetic counseling training program at their university/institution.

Assessment of Career Advising Resources

The next set of questions addressed the resources advisors used to gather information on genetic counseling for themselves as well as the resources they provided to students. The majority of respondents (85.3%) used online resources, such as the NSGC website, to gather more information about the career (Figure 3). Approximately 12.5% of respondents selected the option “Other”, with 35.3% of them writing in that they used ExploreHealthCareers.org.

FIGURE 3: Resources advisors used to gather information on genetic counseling (N=136).
In regards to resources advisors provided to students, the majority (77.4%) provided students with the career website ExploreHealthCareers.org. Approximately 5% did not provide any resources to their advisees (Figure 4).

**FIGURE 4: Resources advisors provided to students about genetic counseling (N=137).**

<table>
<thead>
<tr>
<th>Resources</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explorehealthcareers.org (or similar career website)</td>
<td>77.4%</td>
</tr>
<tr>
<td>NSGC website</td>
<td>56.9%</td>
</tr>
<tr>
<td>Specific genetic counseling training program website</td>
<td>56.2%</td>
</tr>
<tr>
<td>Accreditation Counsel for Genetic Counseling (ACGC) website</td>
<td>31.4%</td>
</tr>
<tr>
<td>Contact information of a genetic counseling student/genetic counselor</td>
<td>20.4%</td>
</tr>
<tr>
<td>A brochure (either paper or electronic) on genetic counseling</td>
<td>8.0%</td>
</tr>
<tr>
<td>Contact information of a colleague or fellow college career/pre-health advisor who knows about genetic counseling</td>
<td>7.3%</td>
</tr>
<tr>
<td>Other</td>
<td>5.8%</td>
</tr>
<tr>
<td>A seminar/workshop/lecture presented on genetic counseling</td>
<td>5.1%</td>
</tr>
<tr>
<td>None</td>
<td>5.1%</td>
</tr>
<tr>
<td>Contact information of a genetic counselor that I met with</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

When asked on what topic(s) the respondents wanted more information on regarding genetic counseling, greater than 50% responded that they would like more information on every topic listed, including salary, job responsibilities, job availability, and competitiveness of the programs (Figure 5).
Barriers to Advisors’ Knowledge about Genetic Counseling

At the end of the survey, we asked respondents if there was anything else about discussing genetic counseling with students that they would like to comment on. Several respondents mentioned that one of the reasons advisors might not know as much about genetic counseling as they do about other health professions, was that their students seemed to lack interest in genetic counseling. Given this, the advisors did not feel the need to gather more information on genetic counseling. Others commented that they expect their students to do the research into the genetic counseling profession on their
own. As a result, the advisors do not take on the responsibility of doing the research
themselves.

Despite this, most respondents indicated an interest in learning more about genetic
counseling as a career option for their students.
DISCUSSION

The goals of our study were to assess the knowledge-base that college career/pre-health advisors have about genetic counseling and to learn how up-to-date and accurate their information is. College career/pre-health advisors are an underutilized resource in recruiting students to enter the field of genetic counseling and genetic counseling is often the least frequently discussed health career option with college students (Rogers et al 2016). It is important to determine what those advisors who do advise about genetic counseling know about the field and ascertain what they are telling their students. Genetic counselors and NSGC can help rectify any misinformation that may be hindering recruitment into the field.

Discussing Genetic Counseling with Advisees

All respondents included in our study had discussed genetic counseling with a student at least once in the past three years and there was a clear lack of confidence amongst the advisors surveyed in terms of their comfort level in discussing different aspects of genetic counseling, including requirements/qualifications to training programs, features of training programs, and the career itself.

Many advisors were unsure about many of the details regarding applying to training programs as well as the curricula of the various training programs. For example, advisors were unaware as to whether students should have some experience in crisis counseling before they apply to training programs. Advisors were also unsure about
whether students need to submit their GRE scores as part of their application as well as the number of training programs in existence in the US and how the curricula varied between them. These are topics about genetic counseling that advisors should be familiar with – and confident about – in order to help their advisee(s) decide if genetic counseling is a career path in which they can be successful.

We also found that advisors were largely unaware of what a career as a genetic counselor might entail. Almost half of the respondents were unsure of the current average salary of genetic counselors. Most respondents were unsure of the variety of roles that genetic counselors can play in the medical field.

Genetic counseling is a fast growing field, so it can be difficult for advisors to stay abreast of the current knowledge about the career. However, the career is expanding in ways that may appeal to more potential students, so advisors should at least be aware of the various ways that the career is changing and growing so that they can identify a broader array of potential students whom they believe can be successful in the career.

Many advisors responded that they believed there was a lack of interest in genetic counseling amongst their students and this was why they were not discussing it with them. Other advisors commented that they expected students to do the research about genetic counseling on their own. In addition, some advisors indicated that they feel as though they cannot be expected to know such detailed information about this career when the majority of their students are pursuing medical school rather than a genetic counseling program.

Advisors are often responsible for advising a very large number of students and it is understandable that they might not have time to research the details of the genetic
counseling career on their own. However, the perceived lack of interest amongst their students could actually be a lack of knowledge that the students have about the career choice as well. It is possible that students would be interested in the career if they knew more about it. Advisors can help fill in the students’ lack of knowledge about genetic counseling by communicating more with students about this career path.

**Ways to Improve Advisors’ Knowledge on Genetic Counseling**

It is important that advisors feel confident discussing genetic counseling, as well as other health professions, so that they can better counsel advisees about career paths appropriate for their interests and abilities. Here, we suggest steps that genetic counselors and their affiliated organizations, such as NSGC, can take to educate advisors about all areas of genetic counseling with the goals of increasing education about and recruitment into the field.

*Development of a Factsheet on Genetic Counseling*

We found that many advisors use ExploreHealthCareers.org as a resource to obtain information about genetic counseling. While resources like ExploreHealthCareers.org are useful in accessing quick facts about genetic counseling, such as salary and job outlook, they often do not provide information about the specific education requirements or training program coursework. ExploreHealthCareers.org is an excellent starting point for advisors to get more information on genetic counseling; however, it should not be the only resource used, as there is much more information about genetic counseling that is not included on this website.

We also found that when advisors get their information directly from someone in the field or very closely associated with the field, they feel more reassured in their
information and are also more likely to discuss the career with students. In addition, we found that advisors who provided students with a reliable resource, like the National Society of Genetic Counselors (NSGC) website, felt more confident in their knowledge about genetic counseling.

Representatives from the field of genetic counseling, specifically trusted organizations like NSGC or certified genetic counselors themselves, could provide information directly to and specifically for advisors, through a factsheet or annotated resource guide, to ensure that advisors are getting accurate information. A factsheet or resource guide with an extensive list of resources on genetic counseling, such as the one provided to advisors who completed our survey (Appendix D), may encourage more advisors to discuss the career with students, knowing that their information about genetic counseling is accurate, up-to-date, and from a trusted source.

*Additional Presentations on Genetic Counseling to Health Advisors*

Genetic counselors interested in education and outreach should be encouraged to give presentations at local universities near their workplace to spread the word about genetic counseling to potentially interested students and advisors eager to learn more. This would ensure that the information the students and advisors are getting is accurate, as it would be coming directly from a certified genetic counselor. This would also allow students and advisors to ask specific questions about the career path or training programs.

In addition, we suggest that genetic counseling graduate training programs could do more outreach at their own universities so that their advisors as well as students become more aware of their presence. It would be helpful if the graduate programs gave presentations at their own universities containing specific information about their own
program so that advisors at those universities can provide interested students on campus with accurate information about that training program. Training programs might also let their career advisors know about opportunities for interested students to sit in on some of their classes.

**Advisors as an Underutilized Resource**

Overall, advisors responded that they want more information about all areas of genetic counseling, including job availability and training program information. This indicates that most advisors are highly motivated to learn more about the career. This also indicates that most advisors are interested in having specific, comprehensive information about genetic counseling. If genetic counselors or organizations like NSGC provided advisors directly with clear and accurate information about the career, advisors may be better able to guide students to this career path. Advisors have the potential to be an excellent resource in terms of recruiting potential students to the career if they have complete, accurate, and easy to access information about the career.

**Future Directions**

While this study focused on targeting advisors who had discussed genetic counseling with at least one student in the past three years, future studies could target advisors who have never discussed genetic counseling with a student. Genetic counseling organizations may want to know what their knowledge is about genetic counseling and why they have not advised students on this career. This would also be an excellent population to target for outreach in order to increase recruitment of students to genetic counseling.
A future study could create a list of resources about genetic counseling to provide to advisors and then follow up by surveying them to ask how helpful they found those resources. While this study provided advisors with a Resource Guide (Appendix D), advisors were provided with this resource only after they completed the entire survey and there was no follow up conducted regarding whether they found the Resource Guide helpful or how they planned to use it when advising students.

Many advisors reported that they encouraged interested students to conduct their own research on genetic counseling. A follow-up study could survey genetic counselors and genetic counseling students and ask them how helpful their advisors were in helping them research the field. It would be interesting to know how many advisors were able to take a more active role in helping the student research the field. It would also be interesting to know how this impacted the student’s overall excitement or feelings about pursuing genetic counseling versus if the student did research on their own with little to no help from their advisor.

A follow-up study could also look at the current outreach that genetic counseling training programs are doing, if any. Our study found that having a training program at their university did not seem to impact the advisors’ own confidence in discussing the career. It would be interesting to know how involved training programs are in outreach at their own universities or other local schools. This also seems like an underutilized way to raise awareness and increase recruitment into the genetic counseling field.

**Study Limitations**

Though we are able to draw some conclusions from our study, it is limited by sample size and sample bias. The survey results may not be indicative of the feelings and
knowledge that all advisors have on genetic counseling. Our survey was only available to advisors who are members of the National Association of Advisors for the Health Professions (NAAHP). This population is comprised mostly of pre-health advisors so it is unclear how advisors who do not regularly advise pre-health students feel about advising on genetic counseling. It is also possible that respondents who feel strongly about genetic counseling or know particularly more or particularly less than the average advisor about genetic counseling may have been more likely to complete the survey.

It is also important to note that advisors’ confidence in their own knowledge about genetic counseling may have decreased as they progressed through the survey. It is possible that as advisors were taking the survey, they realized their own gaps in their knowledge on genetic counseling and, by the time they were answering the final set of true/false questions, their answers were more biased towards the “unsure” answer choice.
CONCLUSION

Overall, this study provides insight into the way that college career/pre-health advisors advise on genetic counseling to their students. This study identified where some of the gaps in advisors’ knowledge on genetic counseling are and how unconfident advisors are in speaking with students about this career path. Our results suggest that there is room for improvement in terms of increasing advisors’ knowledge in all areas of genetic counseling, including requirements/qualifications to training programs, the various features of different training programs, and the career itself. Our results also offer ways that genetic counselors and affiliated organizations can work to increase the advisors’ knowledge about the career path. Our study indicates that advisors are an underutilized yet highly motivated resource in terms of increasing recruitment into the genetic counseling field.
REFERENCES

### Table A. Demographics: State of Employment

<table>
<thead>
<tr>
<th>States of Current Employment (N=135)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>3</td>
<td>MT</td>
</tr>
<tr>
<td>AK</td>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>AZ</td>
<td></td>
<td>NV</td>
</tr>
<tr>
<td>AR</td>
<td></td>
<td>NH</td>
</tr>
<tr>
<td>CA</td>
<td>6</td>
<td>NJ</td>
</tr>
<tr>
<td>CO</td>
<td>4</td>
<td>NM</td>
</tr>
<tr>
<td>CT</td>
<td>4</td>
<td>NY</td>
</tr>
<tr>
<td>DE</td>
<td>1</td>
<td>NC</td>
</tr>
<tr>
<td>FL</td>
<td>3</td>
<td>ND</td>
</tr>
<tr>
<td>GA</td>
<td>5</td>
<td>OH</td>
</tr>
<tr>
<td>HI</td>
<td></td>
<td>OK</td>
</tr>
<tr>
<td>ID</td>
<td></td>
<td>OR</td>
</tr>
<tr>
<td>IL</td>
<td>7</td>
<td>PA</td>
</tr>
<tr>
<td>IN</td>
<td>4</td>
<td>RI</td>
</tr>
<tr>
<td>IA</td>
<td>3</td>
<td>SC</td>
</tr>
<tr>
<td>KS</td>
<td></td>
<td>SD</td>
</tr>
<tr>
<td>KY</td>
<td>2</td>
<td>TN</td>
</tr>
<tr>
<td>LA</td>
<td></td>
<td>TX</td>
</tr>
<tr>
<td>ME</td>
<td>2</td>
<td>UT</td>
</tr>
<tr>
<td>MD</td>
<td>1</td>
<td>VT</td>
</tr>
<tr>
<td>MA</td>
<td>11</td>
<td>VA</td>
</tr>
<tr>
<td>MI</td>
<td>10</td>
<td>WA</td>
</tr>
<tr>
<td>MN</td>
<td>3</td>
<td>WV</td>
</tr>
<tr>
<td>MS</td>
<td>1</td>
<td>WI</td>
</tr>
<tr>
<td>MO</td>
<td>5</td>
<td>WY</td>
</tr>
</tbody>
</table>
Table B. Demographics: Institution and Advising Experience

<table>
<thead>
<tr>
<th>Institution Size (N=86)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5,000 undergrads</td>
<td>50</td>
<td>58.1%</td>
</tr>
<tr>
<td>5,001-10,000 undergrads</td>
<td>19</td>
<td>22.1%</td>
</tr>
<tr>
<td>&gt;10,001 undergrads</td>
<td>17</td>
<td>19.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Advisors per Institution (N=129)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 Advisors</td>
<td>92</td>
<td>71.3%</td>
</tr>
<tr>
<td>6-15 Advisors</td>
<td>25</td>
<td>19.4%</td>
</tr>
<tr>
<td>&gt;16 Advisors</td>
<td>12</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years of Experience Advising (N=132)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>45</td>
<td>34.1%</td>
</tr>
<tr>
<td>6-10 years</td>
<td>45</td>
<td>34.1%</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>42</td>
<td>31.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Advisees/Academic Year (N=148)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-50 students</td>
<td>29</td>
<td>19.6%</td>
</tr>
<tr>
<td>51-100 students</td>
<td>13</td>
<td>8.8%</td>
</tr>
<tr>
<td>101-150 students</td>
<td>11</td>
<td>7.4%</td>
</tr>
<tr>
<td>&gt;150 students</td>
<td>95</td>
<td>64.2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency Advising Pre-Health Students (N=134)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Half of the time</td>
<td>14</td>
<td>10.4%</td>
</tr>
<tr>
<td>Majority of the time</td>
<td>56</td>
<td>41.8%</td>
</tr>
<tr>
<td>Only advise pre-health students</td>
<td>64</td>
<td>47.8%</td>
</tr>
</tbody>
</table>
Table C. Demographics: Home Departments and Nearest Genetic Counseling Training Program

<table>
<thead>
<tr>
<th>Do Advisors also Serve on Faculty? (N=148)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53</td>
<td>35.8%</td>
</tr>
<tr>
<td>No</td>
<td>95</td>
<td>64.2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Departments in which Advisors Serve (N=53)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>29</td>
<td>54.7%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>7</td>
<td>13.2%</td>
</tr>
<tr>
<td>General Science</td>
<td>4</td>
<td>7.5%</td>
</tr>
<tr>
<td>Medical Education</td>
<td>3</td>
<td>5.7%</td>
</tr>
<tr>
<td>Student Life</td>
<td>2</td>
<td>3.8%</td>
</tr>
<tr>
<td>Career Services</td>
<td>2</td>
<td>3.8%</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>11.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work at Institution with Training Program (N=135)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>16</td>
<td>11.9%</td>
</tr>
<tr>
<td>No</td>
<td>114</td>
<td>84.4%</td>
</tr>
<tr>
<td>Unsure</td>
<td>5</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Live in City with Training Program (N=135)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>23</td>
<td>17.0%</td>
</tr>
<tr>
<td>No</td>
<td>92</td>
<td>68.1%</td>
</tr>
<tr>
<td>Unsure</td>
<td>20</td>
<td>14.8%</td>
</tr>
</tbody>
</table>
APPENDIX B: Recruiting Materials

Recruitment Notice Email:

Subject: Genetic Counseling: College career advisors’ experiences and knowledge when advising students on genetic counseling

Dear National Academic Advising Association Members:

My name is Sarah Carroll and I am a second year graduate student in the Brandeis University Genetic Counseling Program. I am writing to request your permission in a survey as part of my thesis research project, titled: “Digging a little deeper: What do college career advisors know about genetic counseling? What do they want to know?”.

The purpose of this study is to discover what college career advisors are telling their advisees regarding genetic counseling, how updated that information is, and if there are any gaps in the information advisors have on genetic counseling. The results of this study will serve raise awareness of genetic counseling amongst college career advisors and will also help the field of genetic counseling understand potential areas for recruitment.

The survey will explore your awareness of genetic counseling as a career option as well as your experience advising students on genetic counseling. It will ask you what you know about genetic counseling and what additional information and/or resources you would like on genetic counseling.

Here are some important things to know about this study:

- This survey is open to college career advisors currently employed in the United States
- The survey will take approximately 10-15 minutes to complete
- The survey is anonymous and participation is voluntary
- You can skip questions you do not feel comfortable answering and can exit the survey at any time
- All participants who complete the survey may enter a drawing for one of six $25 gift cards to Amazon.com. Your survey responses will not be connected to your contact information
- All participants who complete the survey will get access to a Resource Guide that contains an annotated list of useful websites with information on genetic counseling
- This survey will be available until early-February 2017
This study was reviewed and approved by the Brandeis University Institutional Review Board. If you have any questions about this research project, please contact Sarah Carroll at scarroll@brandeis.edu, or the Brandeis University faculty sponsor, Judith Tsipis, at tsipis@brandeis.edu.

Click “here” to take the survey (will hyperlink to Qualtrics).

Thank you in advance for your time and participation.

Sincerely,
Sarah Carroll
Master’s Degree Candidate, Class of 2017
Genetic Counseling Program, Brandeis University
APPENDIX C: Survey Questions

Digging a little deeper: What do college career/pre-health advisors know about genetic counseling? What do they want to know?

Q1 Welcome! You are being asked to participate in this study because you are currently a college career advisor/pre-health advisor who is employed in the United States. The purpose of this research is to explore your awareness of genetic counseling as a career option as well as your experience advising students on genetic counseling.

The results of this study will serve to raise awareness of genetic counseling amongst college career advisors and will also help the field of genetic counseling understand potential areas for recruitment.

Your responses to this online survey will be anonymous. This survey is estimated to take 10-15 minutes. Participation in this survey is voluntary. You may skip any question you do not feel comfortable answering and you may exit the survey at any time.

Please only take this survey once.

Participants may benefit from feeling as though they have learned new or additional information about genetic counseling that could be used to advise students on genetic counseling in the future. There are minimal risks to participants. Some participants may feel distress when answering some of the questions that are intended to assess their knowledge on genetic counseling.

Participants who complete this survey may enter a drawing for one of six $25 Amazon gift cards. If you enter the drawing, you will be directed to a separate survey to provide your email address. Participants who complete the survey will also be provided with a Resource Guide that contains an annotated list of websites with useful information about genetic counseling at the end of the survey. Your contact information will not be linked to any of your survey responses.

If you have any questions about this study, please contact me, Sarah Carroll, at scarroll@brandeis.edu or my thesis committee principle investigator, Judith Tsipis, at tsipis@brandeis.edu.

This study was reviewed and approved by the Brandeis University Institutional Review Board. If you have questions about your rights as a research subject, please contact the Brandeis University Institutional Review Board at irb@brandeis.edu or 781-736-8133.
By clicking Next, you acknowledge that you have read the information above and you consent to participate in this survey.

☐ Next
☐ I do not wish to participate

If I do not wish to participate Is Selected, Then Skip To End of Survey

Q2 Part I: General Advising Information

Q3 Are you currently a college career advisor or pre-health advisor in the United States?

☐ Yes
☐ No

If No Is Selected, Then Skip To End of Survey

Q4 Approximately how many students do you advise in a typical school year?

☐ 0
☐ 1-50
☐ 51-100
☐ 101-150
☐ More than 150

If 0 Is Selected, Then Skip To End of Survey

Q5 Do you also serve on the faculty at your university/institution as a professor, researcher, etc.?

☐ Yes
☐ No

If No Is Selected, Then Skip To Q7

Q6 In which department do you serve on the faculty for?

Q7 How frequently have you discussed genetic counseling as a career option with your student(s) over the past three years?

☐ Never
☐ 1-4 times
☐ 5-10 times
☐ >10 times
☐ I don't recall but it was definitely more than once

If Never Is Selected, Then Skip To Q8

Q8 Are you interested in learning more about genetic counseling?

☐ Yes
☐ No

If Yes Is Selected, Then Skip To End of Survey. If No Is Selected, Then Skip To End of Survey
Q9 Of the students with whom you discussed genetic counseling, how often did the student(s) initiate the conversation with you about genetic counseling as a career option?
- ○ Never
- ○ Rarely
- ○ Majority of the time
- ○ Almost always
- ○ I don't recall

Q10 Part II: Advising Students on Genetic Counseling.
The next set of questions contains various statements about the process of becoming a genetic counselor and the career itself. We are interested in learning what college career advisors/pre-health advisors know about genetic counseling and what additional information and/or resources advisors would like on genetic counseling.

Q11 How confident are you in discussing the requirements/qualifications for applying to genetic counseling training programs with students?
- ○ Extremely confident
- ○ Very confident
- ○ Moderately confident
- ○ Slightly confident
- ○ Not at all confident

Q12 When advising students on the requirements/qualifications for applying to genetic counseling training programs, which of the following statements would you present as mostly true? Which would you present as mostly false? Which, if any, are you unsure about?

<table>
<thead>
<tr>
<th></th>
<th>Mostly true</th>
<th>Mostly false</th>
<th>Unsure if true or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students who do not have a degree in psychology or biology cannot apply to training programs</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Genetic counseling is a good option for students who decide they do not want to go to medical school</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Some experience in crisis counseling is highly recommended when applying to training programs</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>Acceptance to a training program is not competitive, because there are so</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>
Students must take the GRE to apply to training programs

Students should have a GPA above 3.0 to apply to training programs

Taking time off to work before applying is a disadvantage to the applicant

Shadowing or speaking with a genetic counselor is important to be a competitive applicant

Q13 Is there anything else you want to share about your experience advising on the requirements/qualifications for applying to genetic counseling training programs?

Q14 How confident are you in discussing the various features of different genetic counseling training programs with students?

- Extremely confident
- Very confident
- Moderately confident
- Slightly confident
- Not at all confident

Q15 When advising students on the various features of different genetic counseling training programs, which of the following statements would you present as mostly true? Which would you present as mostly false? Which, if any, are you unsure about?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mostly true</th>
<th>Mostly false</th>
<th>Unsure if true or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are more than 60 training programs currently in the US</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The training programs are approximately 2 years in length</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Coursework amongst all the programs is standardized</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Some programs offer</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>Lab or research internships/rotations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>All programs require completion of a lab course as part of the curriculum</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>All students must do a thesis project (or equivalent) in order to graduate</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>All programs have a heavier emphasis on counseling/psychology rather than genetics</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>In order to take the Genetic Counseling Certification Exam, you must have graduated from an accredited training program</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q16 Is there anything else you want to share about your experience advising on the various features of different genetic counseling training programs?

Q17 How confident are you in discussing the genetic counseling career with students?
- ☐ Extremely confident
- ☐ Very confident
- ☐ Moderately confident
- ☐ Slightly confident
- ☐ Not at all confident

Q18 When advising students on the genetic counseling career, which of the following statements would you present as mostly true? Which would you present as mostly false? Which, if any, are you unsure about?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mostly true</th>
<th>Mostly false</th>
<th>Unsure if true or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>The salary for a newly minted genetic counselor is currently between $60,000-$80,000</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Genetic counselors always see patients with a doctor/geneticist in</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Almost all genetic counselors have jobs working with pregnant women

An increasing number of genetic counselors are now working in research positions

The main areas of work for a genetic counselor are cancer, pediatrics, and prenatal

In order to become a certified genetic counselor, you must pass the American Board of Genetic Counseling Exam

Genetic counselors have very little autonomy when working in a hospital

Genetic counselors discuss abortion with all pregnant patients they see

All genetic counselors work directly with patients

Anyone can work as a genetic counselor without a Masters of Science degree if they take enough science and counseling classes

Q19 Is there anything else you want to share about your experience advising about the genetic counseling career?

Q20 Part III: Resources on Genetic Counseling
Q21 What resources have you used to gather information on genetic counseling? Check all that apply.

- I contacted a genetic counselor, genetic counseling student, or genetic counseling training program
- I used online resources (National Society of Genetic Counselors website, etc)
- I used a paper resource (brochure, pamphlet, etc)
- I contacted a medical professional who knows about genetic counseling
- I contacted a colleague or fellow advisor who knows about genetic counseling
- I, or a family member, sought genetic counseling services
- Other ____________________

Q22 What resources do you typically provide to a student interested in pursuing a career in genetic counseling? Check all that apply.

- National Society of Genetic Counselors (NSGC) website
- Accreditation Counsel for Genetic Counseling (ACGC) website
- Specific genetic counseling training program websites
- Explorehealthcareers.org (or similar career website)
- A brochure (either paper or electronic) on genetic counseling
- A seminar/workshop/lecture presented on genetic counseling to advisees
- Contact information of a genetic counseling student/genetic counselor
- Contact information of a colleague or fellow college career/pre-health advisor who knows about genetic counseling
- Contact information of a genetic counselor that I have personally met with
- None
- Other ____________________

Q23 Part IV: Assessing what Advisors want to know

Q24 On which of the following topics, if any, would you like more information on regarding genetic counseling? Check all that apply.

- I feel confident in my knowledge of genetic counseling and do not want more information
- Salary
- Job responsibilities
- Job availability
- Work environment
- Pre-requisite classes needed for application to genetic counseling training programs
- Details on the training programs (classes taken, internships/rotations, etc)
- Competitiveness of the programs
- GRE scores/GPA needed for admission
- Extra-curricular experience(s) recommended for admission
- Training program locations
- Opportunities for research in genetic counseling
- The new Match admissions system being implemented by all programs in 2018
- Other ____________________
Q25 Part V: Advisor Demographics

Q26 In which state do you currently work?

Q27 How many undergraduate students attend your university/institution?

Q28 Approximately how many college career advisors/pre-health advisors work at your university/institution?

Q29 How many years have you been working as a college career advisor/pre-health advisor?

Q30 How often do you currently advise pre-health professional students?
   - I rarely advise pre-health professional students
   - About half of my advisees are pre-health professional students
   - The majority of my advisees are pre-health professional students
   - All of my advisees are pre-health professional students

Q31 Does your institution/university have a genetic counseling graduate training program?
   - Yes
   - No
   - Unsure

Q32 Does your city have an institution/university with a genetic counseling graduate training program?
   - Yes
   - No
   - Unsure

Q33 Is there anything else about advising on genetic counseling you would like to share?
APPENDIX D: Resource Guide on Genetic Counseling

Genetic Counseling Resource Guide for College Career Advisors

1. National Society of Genetic Counselors (NSGC)

http://www.nsgc.org/

Helpful Links on the Website:

- About Genetic Counselors
- Who are Genetic Counselors?
- Interested in becoming a Genetic Counselor?
- How could a Genetic Counselor Help you and your Family?
- Frequently Asked Questions

This is a helpful resource for both advisors and prospective students. The National Society of Genetic Counselors is an organization that promotes the professional interests of genetic counselors and provides a network for professional communication. It has information regarding who genetic counselors are as well as information for those interested in becoming a genetic counselor. It also contains information on the professional publication, the Journal of Genetic Counseling, and the NSGC Annual Conference.

To Find a Genetic Counselor:

http://www.nsgc.org/page/find-a-gc-search

This link on the NSGC website contains a comprehensive list of genetic counselors and information on what kind of genetic counseling they perform, their contact information (if provided) and if they welcome student contact. This is a very useful tool for prospective students who are interested in speaking with or shadowing a genetic counselor in order to get more information about the responsibilities of a genetic counselor. This tool can also be used by college career advisors who have questions about the profession and would like to speak directly with a genetic counselor.

Master Genetic Counselor Video Series:

http://www.nsgc.org/p/cm/ld/fid=248
This link on the NSGC website contains videos of simulated genetic counseling sessions in pediatric, prenatal, and cancer settings, led by certified genetic counselors. The videos are intended to help provide individuals with further insight into what is involved in a genetic counseling session; the videos are not intended to substitute the experience of shadowing or speaking with a genetic counselor that most genetic counseling programs highly recommend before application.

2. Genetic Counselors: Personalized Care for your Genetic Health
Brought to you by NSGC

http://aboutgeneticcounselors.com/

Helpful Links on this Website:
- What is a Genetic Counselor?
- What do Genetic Counselors do?
- What Genetic Counselors don’t do?
- Considering Genetic Counseling as a Career?
- How can a Genetic Counselor Help me?

This website is geared towards helping people understand genetic counseling both from the perspective of potential patients as well as future students interested in becoming genetic counselors. It contains helpful information on genetic counseling, genetic counselors, genetic testing, and some genetic conditions. This website is a good resource for those looking for more concise information on an easy to navigate resource.

3. Association of Genetic Counseling Program Directors

https://agcpd.org/

Helpful Links on this Website:
- Program Directory
- Prospective Students
- Admissions Information

This website is helpful for both advisors and prospective students. The AGCPD is intended to promote collaboration between genetic counseling program directors to facilitate recruitment, admissions, education, and guidance of genetic counseling students and to nurture new program development. This resource contains a program directory for those interested in knowing what schools/institutions have Genetic Counseling Training Programs. This resource also contains information on the admission requirements specifically for prospective students.

4. Accreditation Council for Genetic Counseling

http://gceducation.org/
Helpful Links on this Website:
• Accredited Programs

This website is a useful resource for advisors and prospective students who are interested in learning more about where Genetic Counseling Training Programs are located. The ACGC is the specialized program accreditation board for educational training programs granting master’s degrees or higher in genetic counseling. This resource contains a comprehensive list of the Genetic Counseling Training Programs and their accreditation status as well as the years their accreditations expire. The list of training programs also contains the links to each program’s specific website for those wanting more specific information about a particular program.

5. American Board of Genetic Counseling (ABGC)

http://www.abgc.net/ABGC/AmericanBoardofGeneticCounselors.asp

Helpful Links on this Website:
• How do I train to become a certified genetic counselor?
• Find a Certified Genetic Counselor

This website is helpful for prospective students who want to learn more about how genetic counselors become certified. The ABGC is the credentialing organization for genetic counseling in the United States and Canada. The ABGC is responsible for certifying and rectifying qualifying genetic counseling professionals. This is a helpful resource for understanding the qualifications to becoming a genetic counselor and what to expect with the Board Certified Exam. This resource also has a directory that lists certified genetic counselors.

6. Explore Health Careers.org: Genetic Counselor


Helpful Links on this Website:
• Overview
• Academic Requirements

This website is helpful for college career advisors and prospective students who would like more practical information on the genetic counseling career. This resource contains information such as the average salary of genetic counselors, the current job outlook, years of school to complete post high school, and the general academic requirements needed to become a genetic counselor. This resource is useful for providing individuals with an introduction to the genetic counseling career.
APPENDIX E: Answers to True/False Survey Questions

*Answers for “the requirements/qualification for applying genetic counseling training programs:”*

<table>
<thead>
<tr>
<th></th>
<th>Mostly true</th>
<th>Mostly false</th>
<th>Unsure if true or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students who do not have a degree in psychology or biology cannot apply to training programs</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Genetic counseling is a good option for students who decide they do not want to go to medical school</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some experience in crisis counseling is highly recommended when applying to training programs</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptance to a training program is not competitive because there are so many programs</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Students must take the GRE to apply to training programs</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students should have a GPA above 3.0 in order to apply</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking time off to work before applying is a disadvantage to the applicant</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shadowing or speaking with a genetic counselor is important to be a competitive applicant</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Answers for “various features of different genetic counseling training programs:”*

<table>
<thead>
<tr>
<th></th>
<th>Mostly true</th>
<th>Mostly false</th>
<th>Unsure if true or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are more than 60 training programs currently in the US</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>The training programs are approximately 2 years in length</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coursework amongst all the programs is</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Answers for “information on the genetic counseling career:”

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mostly true</th>
<th>Mostly false</th>
<th>Unsure if true or not</th>
</tr>
</thead>
<tbody>
<tr>
<td>The salary for a newly minted genetic counselor is currently between $60,000-$80,000</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic counselors always see patients with a doctor/geneticist in the room</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almost all genetic counselors have jobs working with pregnant women</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An increasing number of genetic counselors are now working in research positions</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The main areas of work for a genetic counselor are cancer, pediatrics, and prenatal</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In order to become a certified genetic counselor, you must pass the American Board of Genetic Counseling Exam</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic counselors have very little autonomy when working in a hospital</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic counselors discuss abortion with all pregnant patients they see</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All genetic counselors work directly with patients</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anyone can work as a genetic counselor without a Masters of Science degree if they take enough science and counseling classes</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>